

Attachment 1

Nevada Bureau of Land Management's Guidance for Hardrock Mining Closure Activities

INTRODUCTION

The Bureau of Land Management (BLM) has the responsibility to ensure that the closure, including reclamation, of hardrock mining operations on BLM administered lands is conducted and completed in a proper manner and is in compliance with all applicable Federal and State laws. This responsibility includes making informed decisions and understanding numerous issues associated with the closure of hardrock mining operations. This guidance document is intended to facilitate Nevada BLM field offices in carrying out its responsibilities, including ensuring coordination with the appropriate State regulatory agencies.

There are four main topics covered in this guidance document.

- When faced with hardrock mining closure, the authorized officer must ensure decisions are made in compliance with the requirements with all Federal and State laws and regulations.
- Closure decisions need to be coordinated and made in collaboration with the State regulatory agencies responsible for the permitting and oversight of mine reclamation and closure activities.
- BLM must ensure adequate financial guarantees are in-place to cover all anticipated costs associated with the closure and monitoring of hardrock mining operations.
- The BLM professionals and managers need to understand and consider all the technical issues associated with hardrock mine closure activities and the long term implications from closure.

AUTHORITY, ANALYSES AND DECISIONS

Resource management activities, including closures, must comply with all Federal laws, including the Federal Land Policy and Management Act (FLPMA), Clean Water Act and National Environmental Policy Act (NEPA), Federal regulations, including 43 CFR 3809, and all applicable State environmental laws and regulations. The fundamental requirement, found in FLPMA and implemented in 43 CFR 3809, is that hardrock mining on the public lands must prevent unnecessary or undue degradation. The Plan of Operations and any modifications to the

approved Plan of Operations must meet the requirement to prevent unnecessary or undue degradation. The requirement to prevent unnecessary or undue degradation does not authorize nor prohibit the authorized release of effluents into the environment. Authorization to allow the release of contaminated waters into the environment must be in compliance with the Clean Water Act, Safe Drinking Water Act, Nevada Groundwater Protection Act, Endangered Species Act, other applicable environmental laws, and consistent with BLM's multiple use responsibilities under the Federal Land Policy and Management Act (FLPMA).

The BLM should ensure closure issues are adequately addressed as part of the initial Plan of Operations. However, it needs to be recognized that proposed closure plans found in the original Plan of Operations are subject to change and are likely to change as more mine development more detailed hydrologic, geologic and chemical information and monitoring data becomes available that may warrant changes to the proposed closure. Where the operator proposes or the BLM requires a modification to the proposed activities the Plan of Operations must be modified.

The authorized officer is responsible for ensuring modifications to approved Plans of Operations involving mine closure decisions are properly reviewed prior to approval. In assessing the need for additional NEPA documentation, the authorized officer should consider the significance of the proposed modification and the adequacy of the NEPA documentation. Any Federal decision to approve a modification to an approved Plan of Operations must be in compliance with the requirements of NEPA.

The following actions will be considered a significant modification of an approved plan of operations. These actions will be analyzed in an environmental assessment to determine if an environmental impact statement is required.

- The proposed modification involves disturbance or use of public land not covered in an approved Plan of Operations.
- The proposed modification is not fully covered in an existing NEPA document.
- The proposed modification has potential impacts not identified and analyzed during approval of the original Plan of Operations.
- The proposed modification contemplates a change in fundamental operating principle such as going from no discharge to discharge.
- The proposed modification has the potential to violate applicable environmental protection statutes and regulations.
- The proposed modification includes additional surface disturbance or construction of new facilities within the project area of an approved Plan of Operations.

Any NEPA documentation needs to consider the potential environmental impacts of the proposed modification, including impacts to surface and ground waters, vadose zone, and any other impacted resources. (For the purpose of this guidance document, the vadose zone is the portion of the earth immediately below the land surface and above the water table. Within this zone the pores contain both water and air, but are not totally saturated with water. The vadose

zone is also referred to as the unsaturated zone.) At a minimum, zero discharge and fluid treatment alternatives need to be considered in the assessment for mine closure actions that are proposing discharge of fluids to the environment that do not meet applicable Federal and State water requirements.

Environmental analyses conducted on proposed modifications will be conducted and/or reviewed by a BLM interdisciplinary team. In addition, public participation in the NEPA process is encouraged and at a minimum will include statewide notification of interested parties that an environmental assessment for mine closure is being prepared. Responses to this notification will be used by the authorized officer to determine if substantial public interest in the proposed modification exists. The authorized officer will then utilize the information contained in the environmental assessment to determine whether or not the proposed modification constitutes unnecessary or undue degradation of the public lands. Approval of the proposed modification will be based on the authorized officer's determination that no unnecessary or undue degradation of the public lands will occur as a result of implementing the proposed modification.

COORDINATION

Early, consistent cooperation and participation by Federal, State, and Tribal entities with review and approval responsibilities for hardrock mining, including closure decisions, is likely the single most effective way to reduce costs and delay in the current approval process. For hardrock mining on public lands, the BLM is the focal point for such needs to take the responsibility to ensure the appropriate coordination takes place with all parties. In addition to the need to coordinate with other governmental entities, the BLM needs to ensure it meets its obligations under NEPA to provide the public an opportunity review and comment on decisions affecting public lands.

The Nevada BLM is specifically committed to coordinate and collaborate to the fullest extent practical with State regulatory agencies responsible for the permitting and oversight of mine reclamation and closure activities. In the coordination with the State regulatory agencies, BLM personnel need to understand the State permit requirements and approval process. It is important to be aware of the different definitions and uses for the term "closure". Closure in the Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation (BMRR) has a fairly specific and limited use. As used by BMRR, closure is when chemical stabilization of a mine site has been achieved after mining activity ceases. State closure requirements primarily deal with stabilization of process and non-process components, solid and liquid process mine wastes, pits, waste rock dumps, ore stockpiles, and any other associated mine components that, if not properly managed during closure and reclamation, could potentially lead to the degradation of the environment. To the BLM, closure has a much less precise usage. Closure is used interchangeably with reclamation, the last stages of reclamation or sometimes as the specific chemical stabilization aspect of reclamation.

In Nevada, the State regulatory agency with primary responsibility for closure decisions is

BMRR. For mine closure, BMRR requires the operator to submit the major documents for review and approval. Discussed below are the four BMRR documents required for mine closure: Tentative Permanent Closure Plan, Final Permanent Closure Plan, and Final Closure Report and Request for Final Closure. The description of these documents is intended to aid the BLM understanding BMRR's closure process and to facilitate in its commitment to coordinate with the State agencies on mine closure issues.

Tentative Permanent Closure Plan - The Tentative Permanent Closure Plan is submitted to the BMRR as part of the Water Pollution Control Permit approval process. When this plan is submitted as part of the original mine approval, it may not reflect the closure options when a mine nears actual closure. BLM and BMRR coordination on the Tentative Permanent Closure Plan should occur as part of the review and approval of the original Plan of Operations/Water Pollution Control Permit.

Final Permanent Closure Plan - The operator must submit the Final Permanent Closure Plan to the BMRR two years prior to the anticipated closure of the mine. To facilitate the review and approval process the plan should be submitted to the BLM for review and approval. To meet BMRR's requirement, the Final Permanent Closure Plan must include closure goals and a detailed methodology of activities necessary to achieve a level of stabilization of all known and potential contaminants at the site. The Final Permanent Closure Plan must include a detailed description of all proposed monitoring that will be conducted to demonstrate how the closure goals are being met. The operator must receive BMRR approval for the closure plan before initiating action. BLM approval may also be required if the Final Permanent Closure Plan proposes a closure option that represents a significant modification from the BLM approved Plan of Operations. However, it should be noted that these closure plans are not always submitted two years prior to closure.

The BMRR recognizes that reclamation activities including reshaping and regrading, covering, placing good topsoil, applying topsoil amendments, and revegetation are in many cases major components of the stabilization and closure process. These reclamation activities should therefore become a part of the closure plan and should be described or referenced as part of the Final Permanent Closure Plan. It is in the operator's interest, as general closure scenarios become more detailed, that the reclamation plan, together with the bond cost calculations, be reviewed and amended as necessary. Failure to coordinate closure and reclamation activities and documentation may result in additional operator encumbered expenditures.

Final Closure Report/Request for Final Closure - Following the completion of all closure activities, a Final Closure Report must be submitted to the BMRR that summarizes all closure and reclamation related activities. This document should also be concurrently submitted to the BLM. At this point, upon approval of the Final Closure Report, the mine site is considered to be in the 'post-closure' period. The Request for Final Closure is made following the completion of the post-closure monitoring period. This period lasts anywhere from five to a maximum of 30 years. The post-closure monitoring period should have validated the operators contention that those closure activities completed have indeed stabilized and verify no undue degradation of

waters of the State. The request should contain all post-closure monitoring information and clearly demonstrate stabilization.

Coordinated Review and Approval

Reclamation/closure of a mine site is addressed in the Plan of Operations approved by the BLM. However, at the time a mine shuts down the closure activities being proposed by the operator may represent a modification from what was originally approved. If the proposed closure method has not been analyzed, then the BLM must consider the change as a Federal action and conduct NEPA. In order to expedite the NEPA and State permitting process, the operator should concurrently submit the Final Permanent Closure Plans to BMR and proposed modifications to the Plan of Operations to the BLM. BLM should coordinate with BMR on review and analysis of proposals and then determine the level of NEPA analysis. The process should flow is:

- Operator submits a Final Permanent Closure Plan to BMR and appropriate modifications to the Plan of Operations to BLM.
- BLM compares the Final Permanent Closure Plan/modifications to the Plan of Operations with the approved Plan of Operations to determine the level of NEPA analysis.
- BLM coordinates with BMR and the operator to reach agreement and concurrence on the Final Permanent Closure Plan.
- BLM prepares the appropriate NEPA documentation.
- BLM and BMR coordinate approval of Final Permanent Closure Plan and modification to the Plan of Operations.

The BLM will strive to cooperatively review and approve methodology and technology necessary to ensure adequate evaluation of water quality issues with BMR. The agencies should coordinate data adequacy and conclusions at the earliest possible time. Where appropriate, the BLM will utilize appropriate environmental regulatory requirements, guidance, standards and test methods (including sludge) as the base for its analyses and reviews. This includes deferring to BMR and U.S. Environmental Protection Agency decisions pursuant to their authority under the Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, Nevada Groundwater Protection Act, and other applicable Federal and State environmental laws where appropriate. Except for point source discharges to waters of the U.S., currently there are no numeric Federal standards for permitting discharges into the environment as part of mine closures. The overriding BLM standard is found in the 43 CFR 809 regulations, specifically the requirement to prevent unnecessary or undue degradation.

FINANCIAL GUARANTEES

Adequate financial guarantees have long been recognized as an essential component of the BLM's effort to ensure the protection of the public lands. Specifically, financial guarantees are

needed when an operator is unable or unwilling to perform reclamation, including closure activities, and other obligations. Existing guidance, "Nevada BLM Bonding Process for Plans of Operations Authorized by 43 CFR 3802/3809" details the procedures for calculating, establishing and releasing financial guarantees.

Review of the current closure process identified concerns with long-term liabilities and unplanned events.

- Financial guarantees to address closure, including long-term obligations.
- Financial guarantees for unplanned or catastrophic events.

Financial Guarantee for Closure - For the BLM, final closure does not occur until all obligations have been met. As such, the BLM must require some form of financial guarantee to cover any long-term obligation defined in the approved Plan of Operations. Per the existing guidance document, final release of the financial guarantee should not occur until all reclamation, including closure requirements are met. These requirements include the need to maintain a financial guarantee until the operator can demonstrate the ability to discharge any residual effluents into the environment to meet standards approved in the Plan of Operations.

Unplanned Events - An area of concern is the status of financial guarantees for unplanned events. These events may be large catastrophic events causing extensive environmental damage or they may only cause minor damage that is easily corrected. The key is that they are unplanned or unforeseen events. Under the current 43 CFR 3809 regulations, the BLM cannot require financial assurances as a contingency for unplanned or unforeseen events. The only real protection the BLM can do to avoid the environmental damages associated with catastrophic events is to ensure the proper planning and design of the systems and facilities.

At the discretion of the authorized officer, the BLM may negotiate with the operator to establish a contingency fund to address unplanned events. This should only be done where the authorized officer determines it is in the government's best interest to establish such a fund. When used as a contingency fund for unplanned events, such a financial mechanism can help alleviate concerns over the costs associated with catastrophic events. Entering into such an agreement clearly would be voluntary on both government's and operator's part.

Conceptually, this type of fund should be a self-sustaining financial instrument held by the BLM. The BLM and operator would have to determine the operating life of the individual components covered by the fund, the duration the fund will be held, and figure replacement costs, including inflation. Discounted Cash Flow (DCF) Analysis would be utilized to determine the amount of funds required at a reasonably fixed interest rate, to establish the financial instrument. The BLM would ensure the fund mechanism have proper financial assurances and accessibility.

TECHNICAL ISSUES

This section of the guidance covers three technical issues: disposal of heap detoxification waters,

disposal of heap drain-down waters, and disposal of process pond sludge. Each issue discussion contains methods and technical alternatives that should be evaluated under best management practices for water and sludge disposal.

Disposal of Heap Detoxification Waters - The following methods for the disposal of heap detoxification water should be evaluated in the NEPA document:

- Water treatment and discharge (infiltration, leach field, injection).
- Land application with or without water treatment (infiltration, leach field, injection).
- Evaporation (zero discharge).
- Combination of evaporation, treatment, or land application.

Disposal of Heap Drain-Down Waters - The following methods for the disposal of heap drain-down waters should be evaluated in the NEPA document:

- Water treatment and discharge (infiltration, field leach, injection).
- Land application with or without water treatment (infiltration, field leach, injection).
- Evaporation (zero discharge).
- Combination of evaporation, treatment, or land application.

Disposal for Both Heap Detoxification and Heap Drain-Down Waters - When infiltration is the method of water disposal for either heap detoxification or heap drain-down the following information needs to be collected and evaluated:

- Chemical quality of the solution to be disposed.
- Survey of surface water (streams, creeks, etc.).
- Depth to the shallowest water table and water aquifer.
- Groundwater quality.
- Volume of disposal waters.
- Soil and surface water monitoring to also include attenuation analysis.
- Vegetation survey.
- Ecological survey.
- Predicted drainage analysis.

The analyses would be included but not limited to State analyses for potential degradation of waters of the State.

When disposing of detoxification and heap drain-down waters utilizing land disposal of any type, soils and sediments in the subsurface need to be tested for metal content. The test method for metal content in earth materials should conform to those identified in EPA/SW-846 or ASTM.

Disposal Process Pond Sludge - Process pond sludge associated with mining processes are exempted from hazardous classification under the Bevill amendment. Process pond sludge must

be tested to determine metal content, pH, and water content prior to evaluating disposal alternatives. The test method utilized to test the sludge should be identified in either EPA/SW-846 or ASTM. In addition, the sludge should be dried to the greatest extent possible before disposal takes place, this can be completed by evaporating the water out of the sludge.

Ways to dispose of sludge:

- Dry sludge and bury on site
- Treat sludge and bury on site.
- Remove sludge to off site facility.

If sludge(s) are disposed of on-site through burial, an appropriate cover and drainage system should be designed to:

- Provide erosional stability.
- Provide optimum surface water run-off and routing.
- Provide in-place physical stabilization.
- Provide optimum evaporation (use of soil materials, vegetation, engineering design, etc.)
- Minimize infiltration through sludge with geosynthetic liners.

Risk Management - When all reasonable and practical measures have been expended in the efforts to reduce organic and inorganic constituents that may reside in soils, draindown/effluent waters, and sludges, related to mining operations of heaps and impoundments then a risk management approach may be initiated.

When contaminants of concern are identified in all waters, soils or sludges during reclamation, these waters or sludges being proposed for land application a risk based management process may be utilized if appropriate. The risk management process that must be used is outlined in the Environmental Protection Agency Guidance for Risk Assessment, as well as, other documents that are referenced in this policy.

The risk process should follow the EPA guidance that is:

- (1) Identify the type of contaminant present or contaminants and the threat that it poses to both human and ecological resources.
- (2) Assess through screening the waters, soils, and sludges to determine if site-specific contaminant levels are exceeding State, Federal and other appropriate standards.
- (3) If contaminant are exceeding State, Federal, or other appropriate standards then conduct risk assessment to determine associated risk to human and ecological resources.
- (4) The risk assessment will determine land application suitability and any additional treatment,

redesign, mitigation necessary to ensure human and ecological health and safety.

- (5) The risk process will allow the BLM to make an informed decision on land application proposals with regard to reclamation plans.

Monitoring Water Disposal in the Unsaturated and Saturated Zones - When land application is utilized to discharge and dispose of process and drain-down waters through an engineered system, the performance of the system must be monitored. The monitoring can be conducted by a monitoring point or series of monitoring points, specifically piezometers and tensiometers.

The tensiometers should be located within the soil or unsaturated lithology zone to collect and monitor the discharge process as it takes place for vadose zone characteristics. The tensiometers should be placed at varying depths and distances around the discharge point(s) from the engineered system. The well(s) should be located in the saturated zone (water table/aquifer) down-gradient of the engineered system and have enough coverage to account for water movement both horizontal and vertical. The well(s) should also be located in such a manner to show system or natural conditions down-gradient from the discharge point(s) in distance increments. By placing well(s) in incremental distances down-gradient from the discharge points one will be able to observe the performance of the engineered system and compare it to the design or effectiveness.

FEDERAL ENVIRONMENTAL STATUTES

BLM is responsible for management of public lands and resources for present and future generations under our statutory and trustee mandates. BLM is committed to close coordination and working through State and local regulations and their statutory primacy requirements to meet our Federal statutory and resource management objectives. As might be applicable to closure and long-term maintenance, BLM's responsibility to be cognizant of and apply through partnership with States or private landowners, the requirements of additional laws, regulations and executive orders, with our Federal scope of responsibilities. The following is a partial list of potentially applicable environmental laws.

Federal Land Policy and Management Act (FLPMA), 1976 - The FLPMA multiple-use management and statutory requirements related to mining are outlined in applicable detail in BLM's Solid Mineral Reclamation Handbook, H-3042-1. The key mandate under FLPMA is that mining activities be conducted so as to prevent unnecessary and undue degradation of the land. The 43 CFR 3709.10-5 (k) goes on to say that "Failure to comply with applicable environmental protection statutes and regulations thereunder will constitute unnecessary or undue degradation." In addition, the closure requirements that need addressed under NEPA and mining include (yet are not limited to) wetland and riparian management, wildlife and fisheries management, rangeland management, recreation management, forestry management and visual resource management per H-3042-1.

Resource Conservation and Recovery Act (RCRA), 1976, amended 1986 - Addresses and

controls the release of materials to the environment by managing waste production from “cradle to grave”; regulates the generation, storage, labeling, transportation, treatment and disposal of solid and hazardous wastes; offers as a national policy that generation of hazardous wastes is to be reduced or eliminated as expeditiously as possible and land disposal is the least favored disposal method.

Beville amendments - specifically addresses mine wastes as RCRA solid wastes and in general exempts high volume / low toxicity wastes or mine wastes generated from mine beneficiation processes from classification as RCRA hazardous wastes. These wastes, however, are not exempt from other environmental laws should a release or threat of release occur.

LDR -Land Disposal Restrictions -encourages source reduction and high technology treatment of wastes.

Citizen Suit Provision-(similar to CWA citizen suit provision, thus can sue individuals)
Wastes not uniquely associated with mining - solid and hazardous wastes not unique to mining are regulated the same as any other generator of wastes and are subject to State regulation. (cupells, waste oil, solvents, aerosol cans, wipers and rags, antifreeze, filters, inert debris, piping, construction wastes, office wastes, septic waste.)

RCRA hydrocarbon treatment - land farming of hydrocarbon soils at mine sites. Treated soils <100ppm Total Petroleum Hydrocarbons (TPH) allowed in Class III Waivered landfills
Class. III Waivered Landfill - Nevada State classification that allows non-hazardous solid wastes, inert construction debris, office wastes, putrescible waste, hot drained/punctured oil filters and tires, treated hydrocarbon contaminated soils <100 ppm TPH. (See Solid Waste Fact Sheet and Mine Guide for Hazardous Waste Management by Nevada Business Environmental Program)

Clean Water Act (CWA), 1977, 1987 - Maintains viability of surface waters, controls/permits discharges, addresses non-point Source Pollution including erosion, establishes ambient Water Quality Standards, protects wetlands, sets standards for pollutants and best management practices reporting and spill prevention

TMDL total maximum daily loads (established by each State for any surface waters of both point and non-point pollution)

Citizen Suit provision allows any citizen to sue any operator, permitted user, regulator, land owner, etc for violations of the Act or lack of enforcement of provisions.

Safe Drinking Water Act (SDWA), 1975, 1986 - Protects groundwater and public drinking water, regulates underground injection, establishes maximum contaminant levels (MCLs) and provides wellhead protection. Infiltration basins and leach fields may require permit under CWA and/or SDWA

Clean Air Act and Amendments (CAA), 1970, 1977, 1990 - Protects and enhances the quality of the Nation's air, controls area and point stationary sources and mobile sources, sets standards for ambient air quality and hazardous pollutants, addresses attainment and non-attainment through State Implementation Plans, and addresses particulates.

TSCA Toxic Substance Control Act (TSCA) 1976, 1986 - Regulates PCBs, asbestos and dioxin.

Comprehensive Environmental Response, Compensation and Liability Act and Amendments (CERCLA), 1980, 1986, 1990 or Superfund Act; and Superfund Amendments and Reauthorization Act (SARA), 1986 - Regulates the release of abandoned hazardous waste and hazardous substance dump sites and provides for cost recovery for cleanups for mostly inactive facilities or releases beyond the facilities at active sites. Addresses or threat of release to air, soil, surface water and groundwater of any hazardous substance defined under the Act, the CWA, the CAA, the RCRA, and the TSCA. Superfund funds not available to Federal Agencies. Also defines "trustee" role of land management agencies and recovery of Natural Resource Damages.

As stated above, the CERCLA addresses all environmental media and public health. Strict and several liability - although arguably limited to owner, BLM needs to address liability risk from a contaminant pathway to environmental media(s) over the long term. Community involvement required in remedy selection

BLM delegated enforcement authority including administrative orders, unilateral orders, and cost recovery under coordination with EPA and DOJ.

BLM may consider sale or exchange as being a land management option

Pollution Prevention Act (PPA) 1990 - Establishes policy of preventing or reducing waste at the source, reducing or treating in an environmentally safe manner, with disposal or permitted release to the environment considered a last resort.

REFERENCES

- Soil testing: ASTM, Testing Methods for Earth Materials
- EPA/SW-846, Test Methods
- ASTM, Guide to Site Characterization for Environmental Purposes with Emphasis on Soil, Rock, and Vadose Zone and Ground Water, D5730, 1997.
- Risk Assessment: EPA/625/4-89/024, Risk Assessment Management and Communication of Drinking Water Contamination, EPA, ORD, June 1989.
- ASTM, STP 1218, Environmental Toxicology and Risk Assessment, third volume, 1995.
- EPA 540/R-97/006, Ecological Risk Assessment Guidance.
- EPA Guidance to Human Health Evaluation Methods, 1991.
- EPA 540/1-89/002, Risk Assessment Guidance for Super fund.
- CERCLA Baseline Risk Assessment Reference Manual, 1995.
- Understanding Risk, NRC, 1996.
- Toxicological Benchmarks Screening Potential Contaminants of Concern Effects on Terrestrial Plants, ORNL, 1995.
- Risks Posed by Solid Wastes, EPA, 1997.
- EPA/600/S-97/002, Priorities for Ecological Protection, 1997.
- BLM/RSC, Technical Note 390, Risk Management for Metals at BLM Mining Sites (Interim Revision of Wildlife Risk Management Criteria, R-99-004, 1999).
- Cleanup Criteria for Contaminated Soil and Groundwater, ASTM, DS 64, second edition, 1996.
- Cover Design: EPA/625/4-91/025, 1991, Design and Construction of RCRA/CERCLA Final Covers.
- EPA/600/2-91/002, Compilation of Information on Alternative Barriers

for Liners and Cover Systems, 1990.

Monitoring: Practical Handbook of Ground-Water Monitoring, D. Nielson, NGWA, 1991.

Sludges: EPA/540/288/004, Technology Screening Guide for Treatment of CERCLA Soils and Sludges, 1988.

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